What Is Claimed Is:

1. A friction-welding device for the integral joining of components, in particular for the joining of hydraulically effective blades having disk- or ring-shaped blade carriers, to produce and repair integrally bladed rotor components for turbo machines, comprising an oscillator, which generates a defined periodic movement of a component and a welding surface provided thereon relative to another component, which is held statically during the welding, and a welding surface provided thereon, with directions of movement parallel to the welding surfaces; having a compression device which presses the welding surfaces against each other at a defined force, and a cartridge which accommodates the moved component outside the welding zone, wherein the oscillator (8, 9) includes two or a greater, even number of piezoactuators (12 to 15, 17 to 20) which are arranged in pairs at least approximately on a line of application, and which are able to be prestressed with respect to the cartridge (11) under pressure generation from opposite sides by piezoelectric linear deformation and, together with the cartridge (11) and the component (3), are displaceable in a synchronously oscillating manner at their cartridge-side ends (3).

2. The friction-welding device as recited in Claim 1, wherein the compression device (10) includes at least one piezoactuator (16) whose piezoelectrically moveable end is able to be coupled to the cartridge (11) so as to introduce a defined compression force (Fs) perpendicular to the welding surfaces (5, 6).

3. The friction-welding device as recited in Claim 1 or 2, wherein mechanical gears such as lever mechanisms, flat-

spring arrangements (22), cam gears, crank controls or similar are present so as to enlarge the relatively small, linear motions of the piezoactuators (21), with the possibility of generating greater movements having straight and/or curved paths.

4. The friction-welding device as recited in one of the preceding claims for the joining of blades to a disk- or ring-shaped blade carrier, wherein the lines of application of the piezoactuators (12 to 15) run transversely to the longitudinal center axis (X) of the blade carrier (4); a pair of piezoactuators (12, 13) engages with the front end of the cartridge (11) from opposite sides on a line of application axially in front of the blade (3); and a pair of piezoactuators (14, 15) engages with the rear end of the cartridge (11) from opposite sides on a line of application axially behind the blade (3).

5. The friction-welding device as recited in one of the Claims 1 to 3, for the joining of blades to a disk- or ring-shaped blade carrier, wherein the lines of application of the piezoactuators (17 to 20) run transversely to the longitudinal center axis (X) of the blade carrier (4); two pairs of piezoactuators (17, 19), each lying on a line of application, engage with the front end of the cartridge (11) from opposite sides, axially in front of the blade (3) at different radial heights (H1, H2) relative to the longitudinal center axis (X) of the blade carrier (4); and two pairs of piezoactuators (18, 20) each lying on a line of application, engage with the rear end of the cartridge (11) from opposite sides, axially behind the blades (3), at different radial heights (H1, H2) relative to the longitudinal center axis (X) of the blade carrier (4).

6. The friction-welding device as recited in Claim 4 or 5, wherein the at least one pair of piezoactuators (12, 13, 17, 19) engaging with the axially front end of the cartridge (11), are moveable in relation to the at least one pair of piezoactuators (14, 15, 18, 20) engaging with the axially rear end of the cartridge (11), are moveable at the same frequency, with the same or a different amplitude and in an in-phase or phase-shifted manner.

7. The friction-welding device as recited in Claim 5 or 6, wherein the geometrical zero points of the oscillation movements of the two pairs of piezoactuators (17, 19) that are offset in height (H1, H2) and engage with the axially front end of the cartridge (11) are displaceable relative to one another, as are the geometrical zero points of the oscillation movements of the two pairs of piezoactuators (18, 20) that are offset in height (H1, H2) and engage with the axially rear end of the cartridge (11).

8. The friction-welding device as recited in one of the preceding claims, wherein the force/path characteristic of the piezoactuators (12 to 21) is selected by geometrical serial and parallel connection of piezoelements (23).

9. The friction-welding device as recited in one of the preceding claims, wherein the maximum required electrical voltage of the piezoactuators (12 to 21) is limited by electrical serial and parallel connection of the piezoelements (23).